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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/840,558	04/23/2001	Robert L. Gerlach	F070	4812

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EXAMINER
GURZO, PAUL M

ART UNIT	PAPER NUMBER
2881	

DATE MAILED: 05/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/840,558	GERLACH ET AL.	
	Examiner	Art Unit	
	Paul Gurzo	2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 March 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-7 and 22* is/are allowed.

6)☒ Claim(s) *8-10,12,14-21,23-26,28 and 29* is/are rejected.

7)☒ Claim(s) *11,13 and 27* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Objections

Claims 2-7 are objected to because of the following informalities: each of these claims are dependent on claim 0. Claim 13 is objected to because it reads that is it dependent on "The scanning electron microscope system of claim 9 10". Appropriate correction is required.

Claim Rejections - 35 USC § 112

Claim 26 recites the limitation "secondary electrons" in line 7. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 20, 21, and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Todokoro et al. (5,872,358).

Regarding claims 20, 21,and 29, 358 teaches a scanning electron microscope system including an energy analyzer (33 and 34), a primary beam column for forming a primary electron beam including an objective lens (8), and a secondary optical system for collecting secondary electrons (23) through the objective lens (8) without degrading the resolution of the primary beam (col. 5, line 1 - col. 6, line 9 and Fig. 5). 358 also teaches the use of a high resolution beam that is 10 nm or less (col. 1, lines 36-44).

Claim 23 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Nishimura et al. (4,470,694).

694 teaches a method of determining the composition of a material comprising creating a beam of electrons (20), directing the electrons toward a specimen through an objective lens (5),

directing through the objective lens (5) secondary electrons emitted by Auger processes, deflecting the secondary electrons away from the path of the primary beam toward an energy analyzer and analyzing the secondary electrons (col. 5, line 1 - col. 6, lines 56, col. 13, lines 23-39, and Fig. 1 and 2).

Regarding claim 24, 694 teaches applying a voltage in the range of 0 to 200 kV to the acceleration tube (col. 6, lines 29-40), and this will lead to greater energies of the primary electrons and therefore greater energies of the secondary electrons.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 8, 9, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimura et al. (4,740,694).

Regarding claim 8, 694 teaches a scanning electron microscope system including a primary electron beam (20) column for scanning the beam across a specimen including Auger electrons (col. 13, lines 23-39 and Fig. 1 and 2). This beam column includes a high-resolution objective lens (5) and Fig. 1 clearly depicts the path of the secondary electrons through the objective lens. 694 depicts an analyzer (19) that can analyze Auger electrons (col. 6, lines 41-48). Though 694 does not explicitly teach a deflector, it is obvious that some type of deflection exists so that the electrons are analyzed by the analyzer and it is obvious that there is no significant degradation of the primary beam. Further, the analyzer system is viewed as a

secondary electron optical system because it collects the Auger electrons for analysis in the same manner as the instant claim. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a primary and secondary system because this will ensure that the primary and secondary electron beams are properly passed and converged by the objective lens so that efficient analysis will occur.

Regarding claim 9, 694 teaches the use of a shield (78) that shields the primary beam from the field (col. 16, lines 4-16 and Fig. 15).

Regarding claim 14, it is obvious that 694 teaches the use of a snorkel lens because it achieves the same results as the prior art.

Claims 10 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimura et al. (4,740,694), and further in view of Schmitt et al. (5,847,399).

694 teaches the primary electron beam column, including a high resolution objective lens (5), for forming a primary electron beam (20) that is scanned across a specimen to cause emission of secondary electrons as well as a secondary electron optical system for collecting secondary electrons through the objective lens without degrading the resolution of the primary beam as taught above. Further, 694 teaches a shield (78) that shields the primary beam from the field, but does not explicitly state that the conductive and resistive qualities. However, 399 teaches the use of an objective lens (5) as well as a shield (61) that shields that primary beam for the field and is conductive on the inside and resistive on the outside (col. 3, line 34 - col. 4, lines 9 and Fig. 1 and 2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a shield with desired qualities because this will prevent destructive currents and field effects.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimura et al. (4,740,694) in view of Schmitt et al. (5,847,399), and further in view of Gerlach (4,806,754). The above-applied prior art does not teach the use of a spherical capacitor, but Gerlach demonstrates the use of one as an energy analyzer for charged particles (col. 2, lines 41-42). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use this capacitor because it is known in the art and achieves the claimed results.

Claims 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimura et al. (4,740,694), and further in view of Todokoro et al. (6,310,341).

Regarding claims 15-18, the above-applied prior art does not teach the use of dual pole magnetic lens. However, Todokoro et al. teach the use of a first and second magnetic pole lens (401 and 402) that is disposed within the lens assembly (col. 7, lines 14-61 and Fig. 4). These poles have an aperture for passing the primary electron beam and they make use of a deflection plate to selectively apply potential. Any modification, such as the addition of coils and movable attachments, is considered obvious to the above teachings and is not given patentable weight. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use these magnetic poles so that the electron beam path can be adjusted for higher electron transmission.

Regarding claim 19, Todokoro et al. teach movement of the sample in the x- and y-directions (col. 1, lines 63-64), and it is known in the art of sample implantation that the sample can be moved in both the horizontal and vertical directions.

Claims 26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimura et al. (4,740,694), and further in view of Todokoro et al. (5,872,358).

Regarding claim 26, 694 teaches a method of Auger electron spectroscopy using a scanning electron microscope comprising directing a beam of primary electrons through an objective lens (5), collecting Auger electrons through the objective lens, and analyzing the energy of the secondary electrons as applied above. The formation of an image based on the energy of the beam is well known in the art, but 694 does not explicitly state this. However, 358 teaches that an image can be obtained based on the beam information that shows the shape or composition of the surface of the sample (col. 1, lines 6-12 and col. 2, line 26 - col. 3, line 21). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to obtain an image so that desired characteristics can be obtained.

Regarding claim 28, 694 teaches the use of a shield as taught above.

Allowable Subject Matter

Claims 1-7 and 22 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

With respect to the independent claim 1, as claimed invention was read in light of the specification, the prior art of record fails to teach the claimed use of an electrostatic capacitor as well as a shield that is conductive on the inside to shield the primary beam and having a potential gradient on the outside to create an external field related to the electric field of the electrostatic capacitor to reduce distortion of the field of the capacitor caused by the shield. With respect to the independent claim 22, as claimed invention was read in light of the specification, the prior art of record fails to teach the collection efficiency being greater than twenty percent for Auger electrons having an energy of 100 eV.

Claims 11, 13, and 27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul Gurzo whose telephone number is (703) 306-0532. The examiner can normally be reached on M-Thurs. 7:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Lee can be reached on (703) 308-4116. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

PMG
April 23, 2003

JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800